10. Rakesh

Program Name: Rakesh.java **Input File: rakesh.dat**

Rakesh liked the UIL regional problem about passwords and decided to dig a little deeper into the topic. He discovered that many systems now allow or require passphrases instead of passwords. A passphrase is a collection of "words" separated by spaces and even punctuation marks. The idea is that a phrase of words, even if unrelated, can be remembered more easily than a 10-15 character password of seemingly random characters but no spaces. Longer has always been better when it comes to passwords but computing power has advanced to a point that makes passwords shorter than 10 characters crack-able and passwords longer than 10 characters can be a challenge to remember. Passphrases are typically longer and the addition of spaces and use of all printable characters increases complexity for cracking them.

As with passwords, Rakesh suspects that a scoring algorithm might help distinguish between acceptable passphrases and exceptional passphrases. Here are the rules and scoring algorithm he has proposed and your challenge is to implement and test it.

Rules:

1. A single "word" is a sequence of non-blank characters and may contain letters, digits, punctuation marks, and all other special characters. A word could consist of all letters, all digits, all special characters, or any mix of those categories of characters. Uppercase and lowercase letters are different so "UIL" and "Uil" would be distinct words as would be "2019" and "2019!".
2. Passphrases must contain 4 or more distinct words separated by spaces, each word containing at least 4 non-blank characters. "UIL" would not count as a word but "2019" would count.
3. Words with less than 4 non-blank characters, like "UIL", are not included in minimum word count but they do contribute towards overall length and are eligible words for other scoring.
4. Minimum length of an acceptable passphrase is 20 characters including spaces.

Scoring:

1. Acceptable passphrases, those that satisfy the above rules, receive an **initial** score of 100 points while others receive a **final** score of 0
2. Each additional word beyond the required minimum results in a 10-point bonus
3. Each word that contains a special character (non-letter and non-digit), even if it is a leading or trailing punctuation mark, results in a 5-point bonus but multiple special characters within the same word do not add more points.
4. Each word that contains a digit results in a 5-point bonus but multiple digits within the same word do not add more points.
5. Each word that contains all uppercase letters results in a 10-point bonus but only if less than half of the words are all uppercase.
6. A passphrase that contains more than one letter and uses only lowercase letters or only uppercase letters, even with digits and special characters results in a 10-point penalty.
7. Each complete word that matches another complete word results in a 20-point penalty for the matching pair. Test data will not contain a set of 3 or more words that all match but there can be multiple pairs of matching words.
8. Each complete word with a length greater than 2 characters that is a prefix or suffix of another word results in a 10-point penalty; however, different words can have the same prefix or suffix ar no penalty.

Rating Scale:

Score Range	Rating
150 and above	Excellent
125 – 149	Strong
100 – 124	Adequate
75 – 99	Weak
50 – 74	Poor
Below 50	Unacceptable

Rakesh (cont)

Examples:

- **"**`Start with a simple passphrase`**"** has 4 words of at least 4 characters and 5 total words. It gets a 10-point word bonus for **"**`a`**"** for a total score of 110 and would be rated **"**`Adequate`**"**
- **"**`Add some extra digits & special chars!`**"** has 5 words of at least 4 characters and 7 total words. It gets a 30-point word bonus for the extra 4-char word along with **"**`Add`**"** and **"**`&`**"**. It also gets a 10-point special-char bonus for **"**`&`**"** for a total score of 140 and would be rated **"**`Strong`**"**
- **"**`Computer Science UIL 2019!!`**"** has only 3 words of at least 4 characters for a total score of 0 and would be rated **"**`Unacceptable`**"**
- **"**`ing is a prefix of the word ingot and a suffix of confusing and challenging`**"** has 6 words of at least 4 characters and 15 total words. It gets a 110-point word bonus for extra words. It also gets a 10-point penalty for not having different cases of letters. Words **"**`a`**"**, **"**`of`**"**, and **"**`and`**"** are matching pairs and receive a 60-point penalty. **"**`ing`**"** is a prefix of **"**`ingot`**"** and gets a 10-point penalty. It is also a suffix of **"**`confusing`**"** and **"**`challenging`**"** and gets another 20-point penalty. The resulting total score is 110 and would be rated **"**`Adequate`**"**

Input: An unknown number of lines with a single passphrase on each line. The length of individual passphrases will not exceed 80 characters. There will be no more than 50 lines in the judge's data file. Lines may contain any of the common ASCII printable characters between and including the space and the tilde. The data will not contain illegal characters.

Output: For each passphrase, output a single line containing its algorithm score followed by a colon (:) and the corresponding passphrase rating.

Sample input:

```
Start with a simple passphrase
Add some extra digits & special chars!
Computer Science UIL 2019!!
ing is a prefix of the word ingot and a suffix of confusing and challenging
AAAAA  12345  *&^%$  zyxwv  q8Z@~  !Mp76
```

Sample output:

```
110:Adequate
140:Strong
0:Unacceptable
110:Adequate
160:Excellent
```